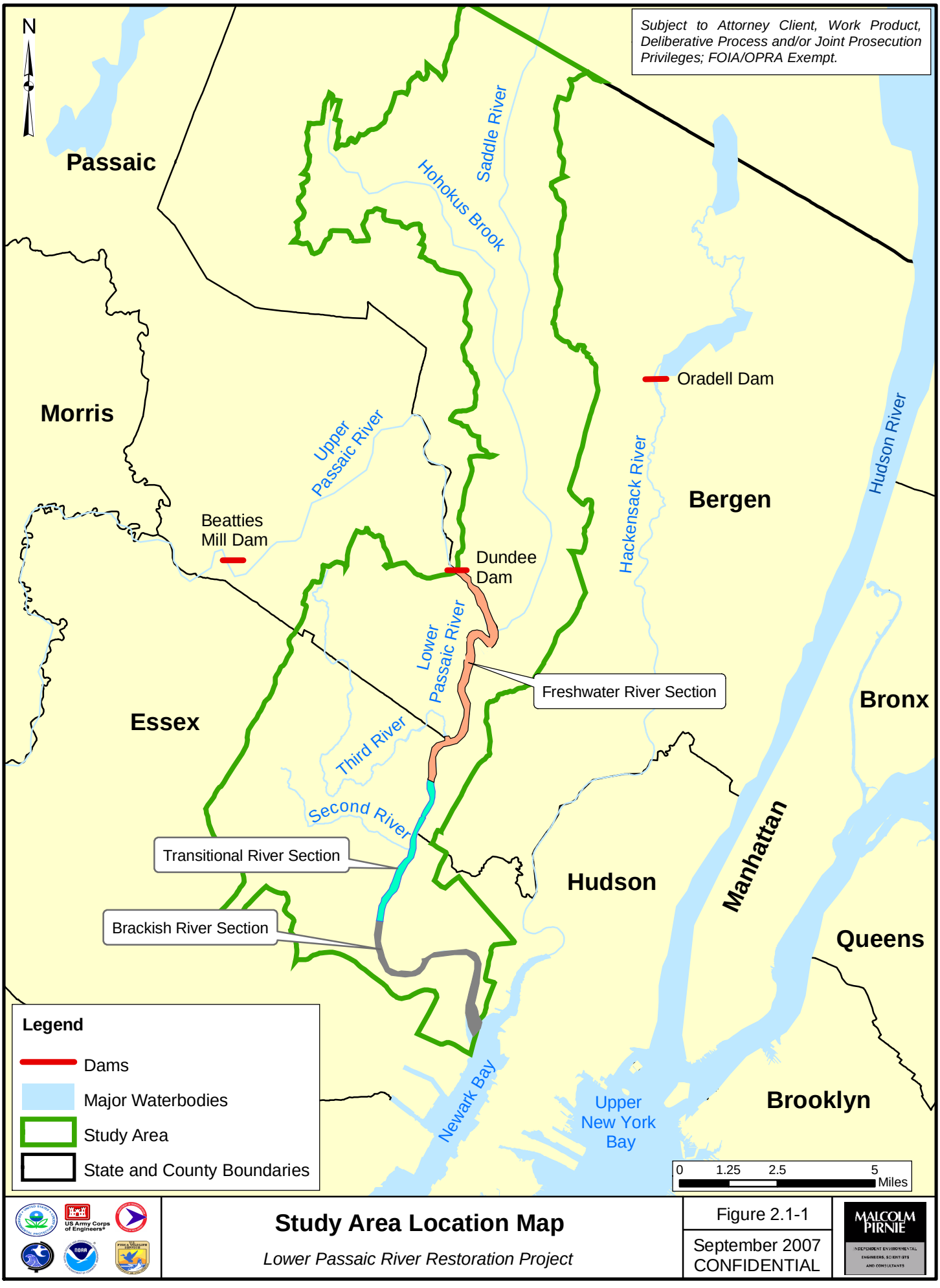

Study Area Location Map

Lower Passaic River Restoration Project

Figure 2.1-1

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Map Document: (S:\Projects\PASSAIC\MapDocuments\4622001-WRDA\MXD\FSP2_033106\MXDS\introduction\sitelocation.mxd)
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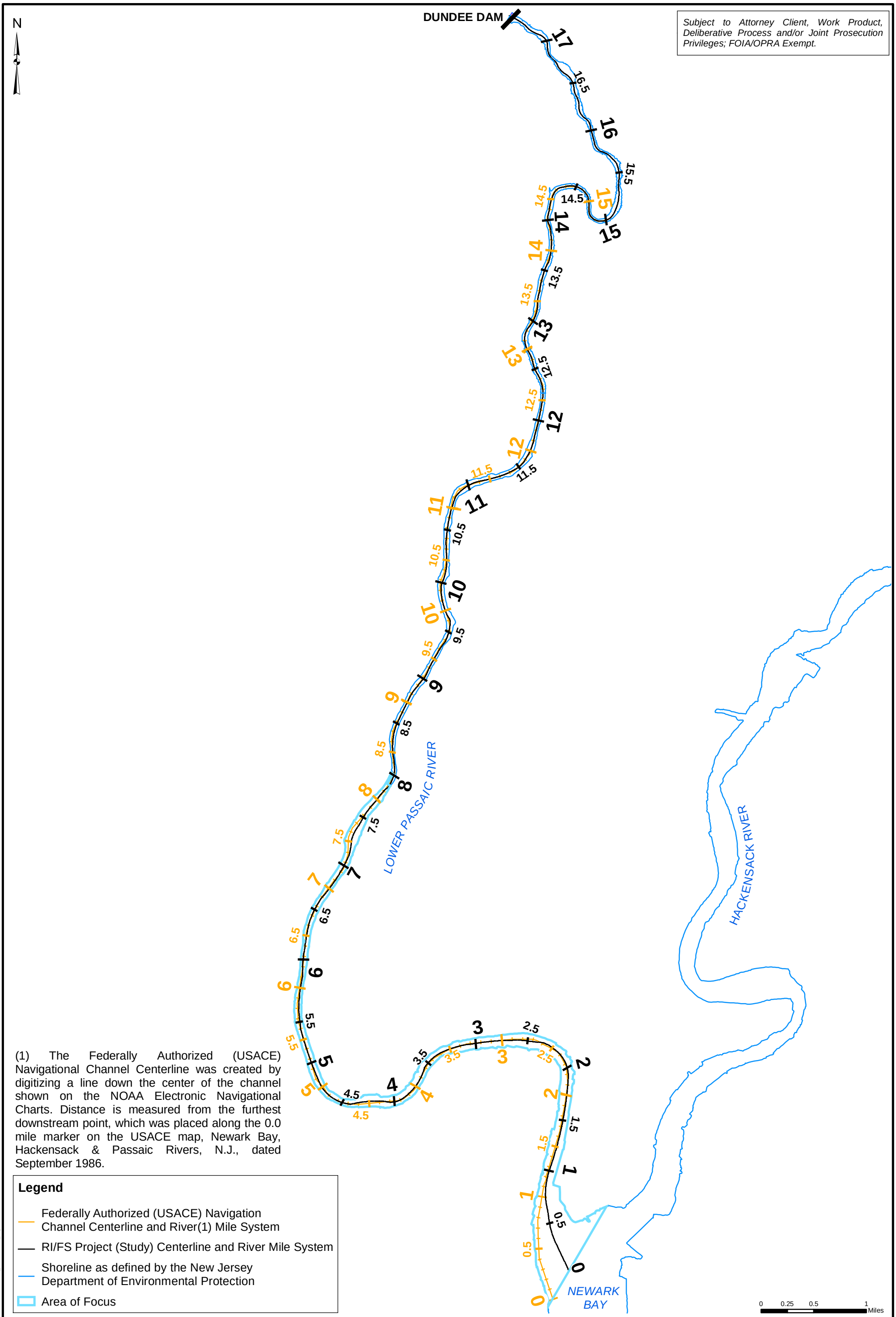

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

(1) The Federally Authorized (USACE) Navigational Channel Centerline was created by digitizing a line down the center of the channel shown on the NOAA Electronic Navigational Charts. Distance is measured from the furthest downstream point, which was placed along the 0.0 mile marker on the USACE map, Newark Bay, Hackensack & Passaic Rivers, N.J., dated September 1986.

Legend

- Federally Authorized (USACE) Navigation Channel Centerline and River(1) Mile System
- RI/FS Project (Study) Centerline and River Mile System
- Shoreline as defined by the New Jersey Department of Environmental Protection
- Area of Focus

US Army Corps of Engineers

Comparison of River Mile Systems

Lower Passaic River Restoration Project

FIGURE 2.1-2

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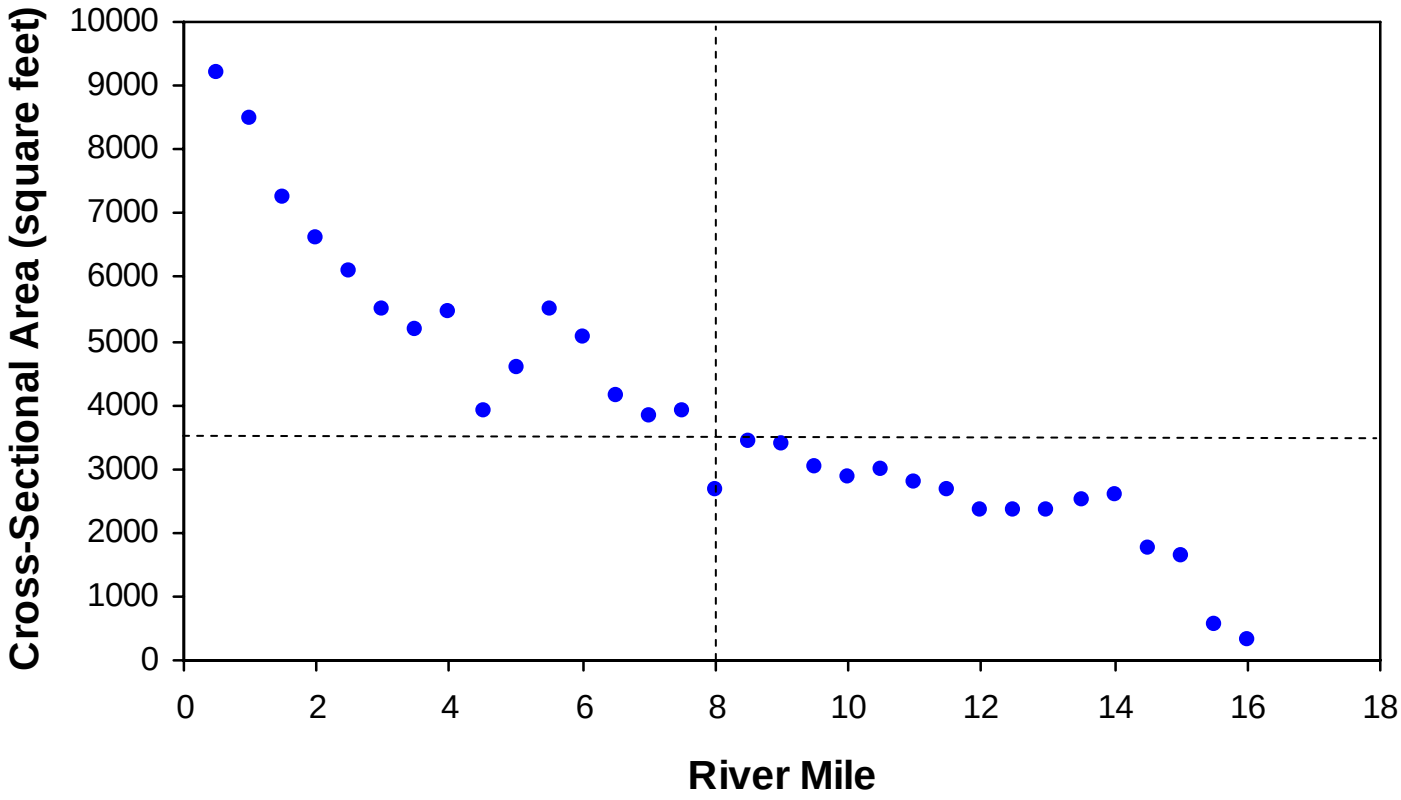

Legend

- Cross-Sectional Area (square feet)
- Highlights the change to a river cross sectional area of 3,500 square feet at RM8 (1)

Notes

Cross-sectional area estimated from 2004 bathymetric data surveyed by Rogers Survey, Inc. for USACE.

Cross-sectional area refers to the water filled area of the river channel when water level is equal to 0 feet elevation at NGVD29.

(1) RI/FS river mile system is used.

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

US Army Corps of Engineers

Variation of Lower Passaic River Cross-Sectional Area with River Mile

Lower Passaic River Restoration Project

Figure 2.4-1

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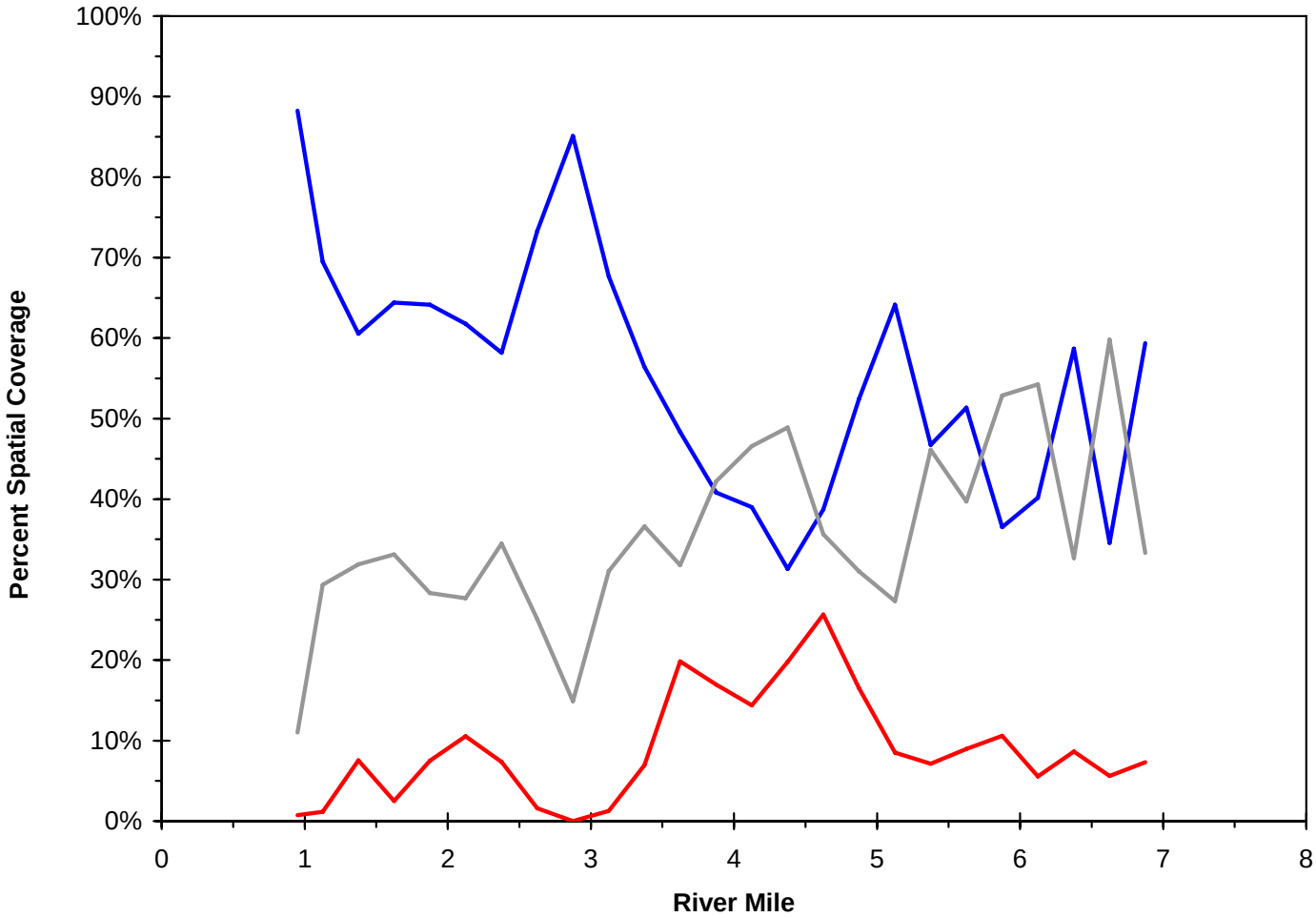

Legend

- Consistently and Occasionally Erosional
- Consistently and Occasionally Depositional
- Bathymetrically Neutral Area

Notes

Refer to Appendix A "Conceptual Site Model" for more detail on net erosional, net depositional, and bathymetrically neutral areas.

RI/FS river mile system is used.

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US Army Corps of Engineers

Percent Spatial Coverage of Net Erosional, Net Depositional, and Bathymetrically Neutral Areas

Lower Passaic River Restoration Project

Figure 2.4-2

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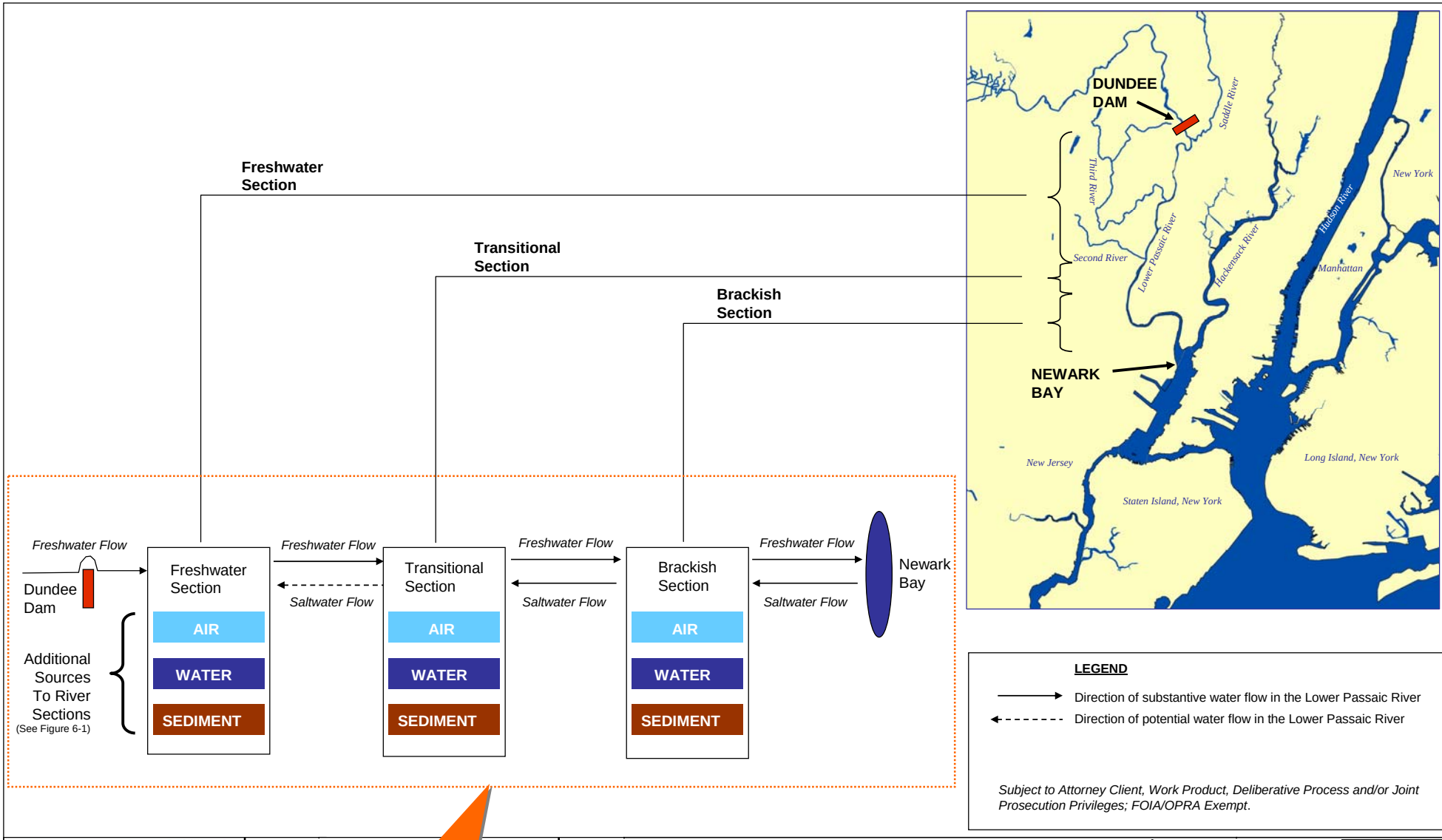

Input to Human Health and Ecological Evaluations

River Sections for the Lower Passaic River

Lower Passaic River Restoration Project

Figure 2.4-3

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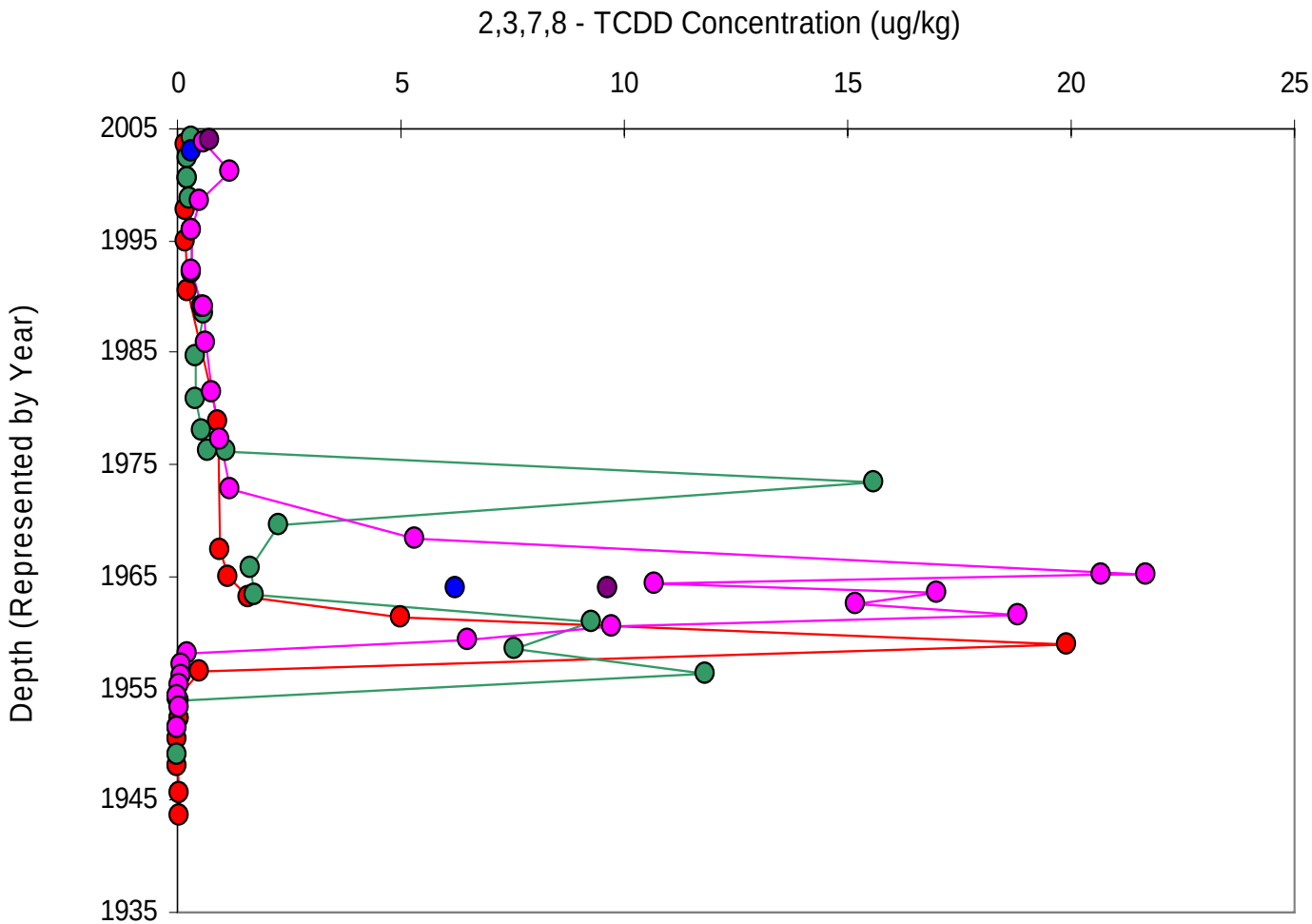

Legend

- 2,3,7,8-TCDD at RM1.4
- 2,3,7,8-TCDD at RM2.2
- 2,3,7,8-TCDD at RM7.8
- 2,3,7,8-TCDD at RM11
- 2,3,7,8-TCDD at RM12.6

Notes

Nondetect concentrations plotted as zero.

Data source: USEPA 2005 High Resolution Sediment Coring Program collected by Malcolm Pirnie, Inc.

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Dated Sediment Core Profile for 2,3,7,8-TCDD Concentration of Lower Passaic River High Resolution Sediment Cores

Lower Passaic River Restoration Project

Figure 2.4-4

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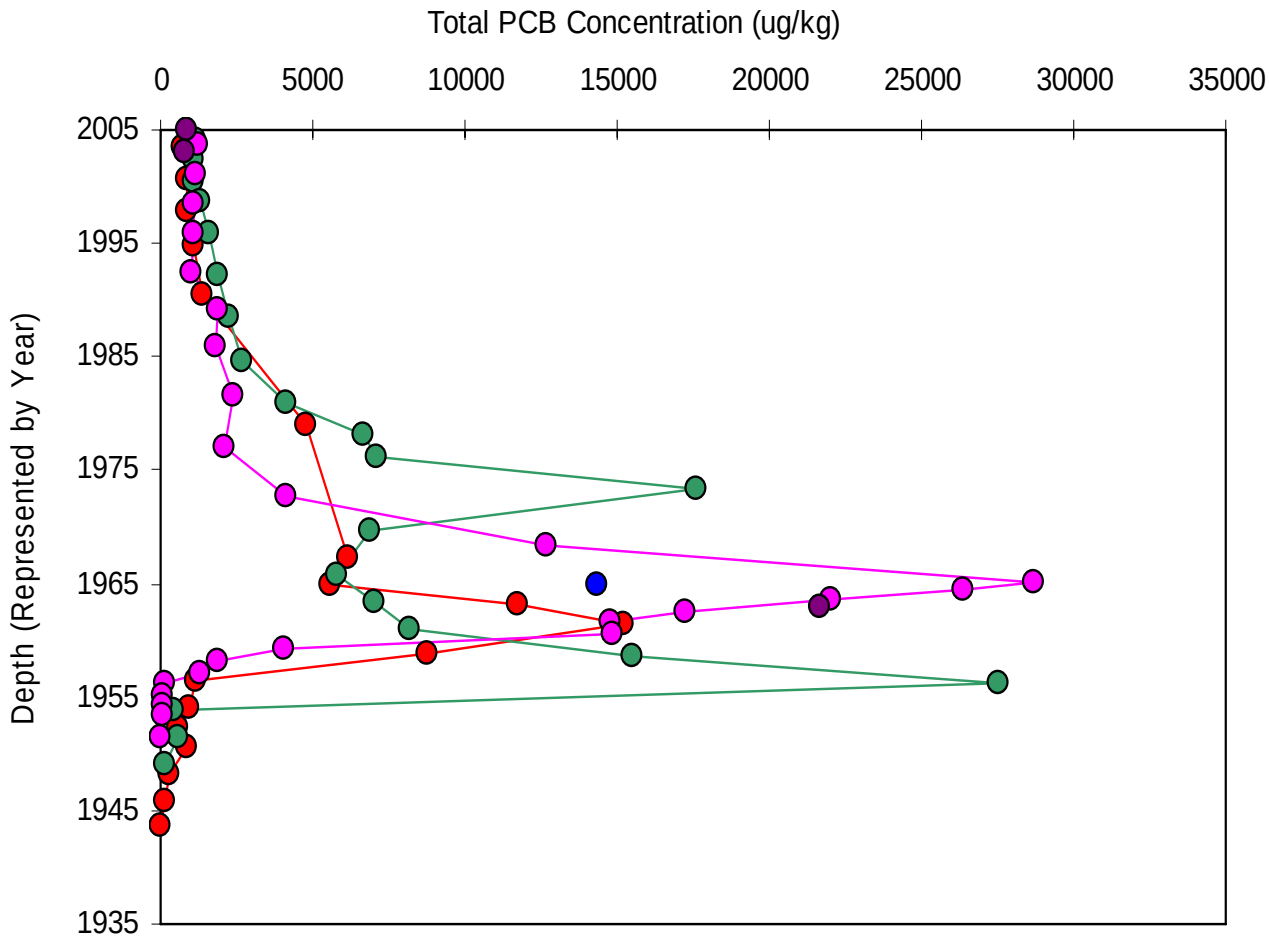

Legend

- Total PCB at RM1.4
- Total PCB at RM2.2
- Total PCB at RM7.8
- Total PCB at RM11
- Total PCB at RM12.6

Notes

Total PCB equals sum of 209 congeners with nondetected PCB congener concentrations equal to zero.

Data source: USEPA 2005 High Resolution Sediment Coring Program collected by Malcolm Pirnie, Inc.

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Dated Sediment Core Profile for Total PCB Concentration of Lower Passaic River High Resolution Sediment Cores

Lower Passaic River Restoration Project

Figure 2.4-5

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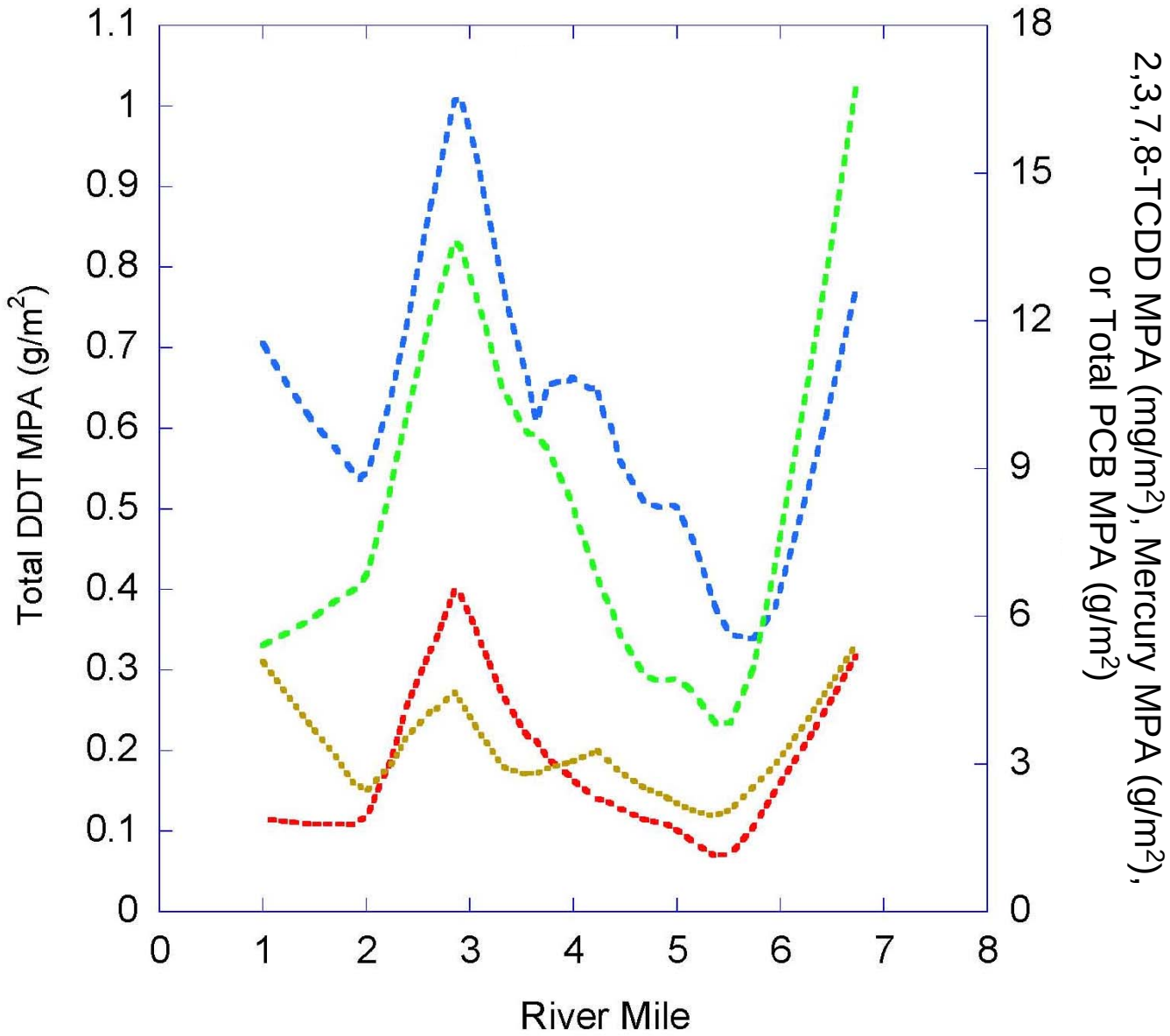

Legend

- Mercury MPA (g/m^2)
- 2, 3, 7, 8-TCDD MPA (mg/m^2)
- Total PCB MPA (g/m^2)
- Total DDT MPA (g/m^2)

Notes

MPA is mass per unit area.

RI/FS river mile system is used.

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Weighted Curve Sediment Inventory vs. River Mile

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Figure 2.4-6

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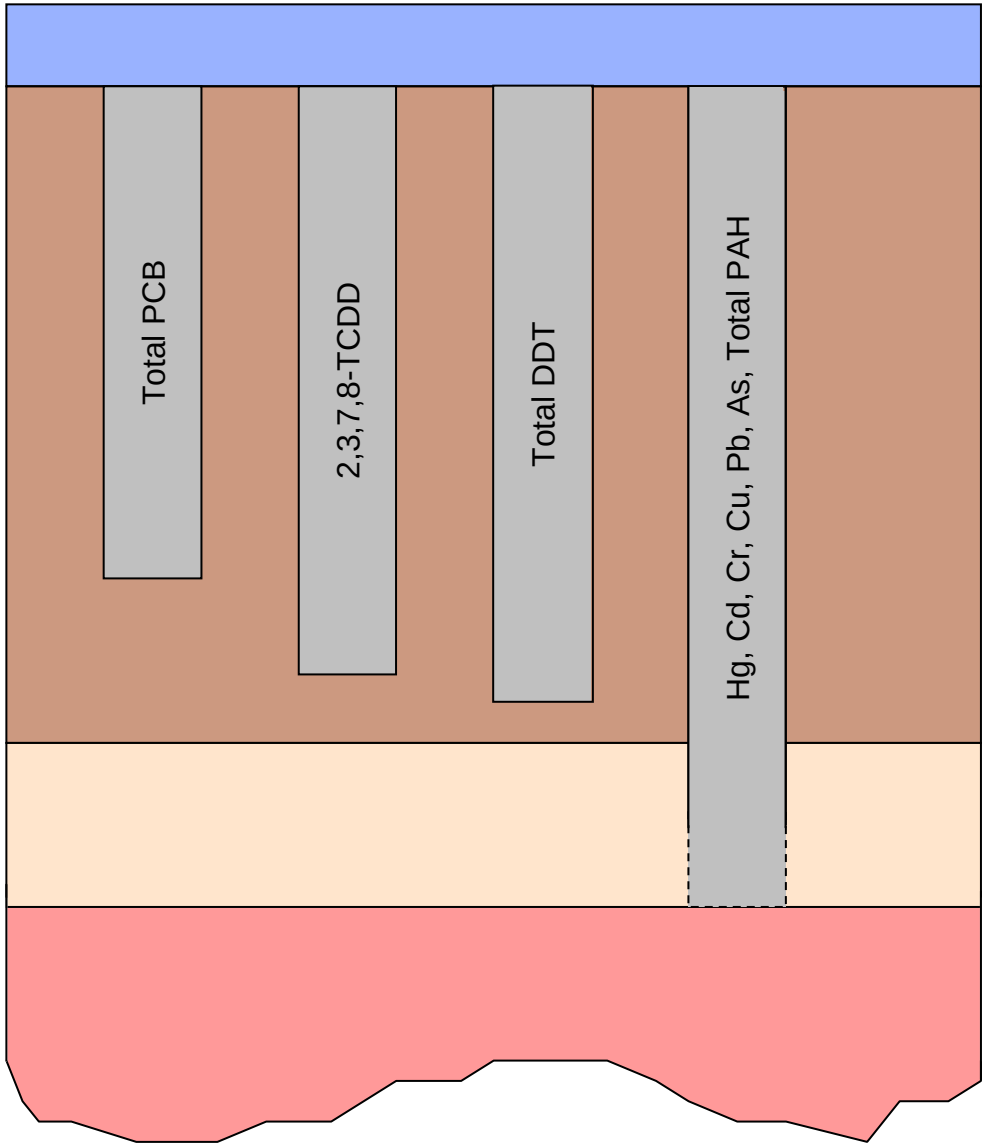

Legend

- Schematic of Sediment Core
- Water
- Fine-Grained Sediment
- Sand
- Clay

Notes

Hg = Mercury
Cd = Cadmium
Cr = Chromium
Pb = Lead
As = Arsenic

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Schematic of Nature and Extent of Contamination in Sediment Beds

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Figure 2.4-7

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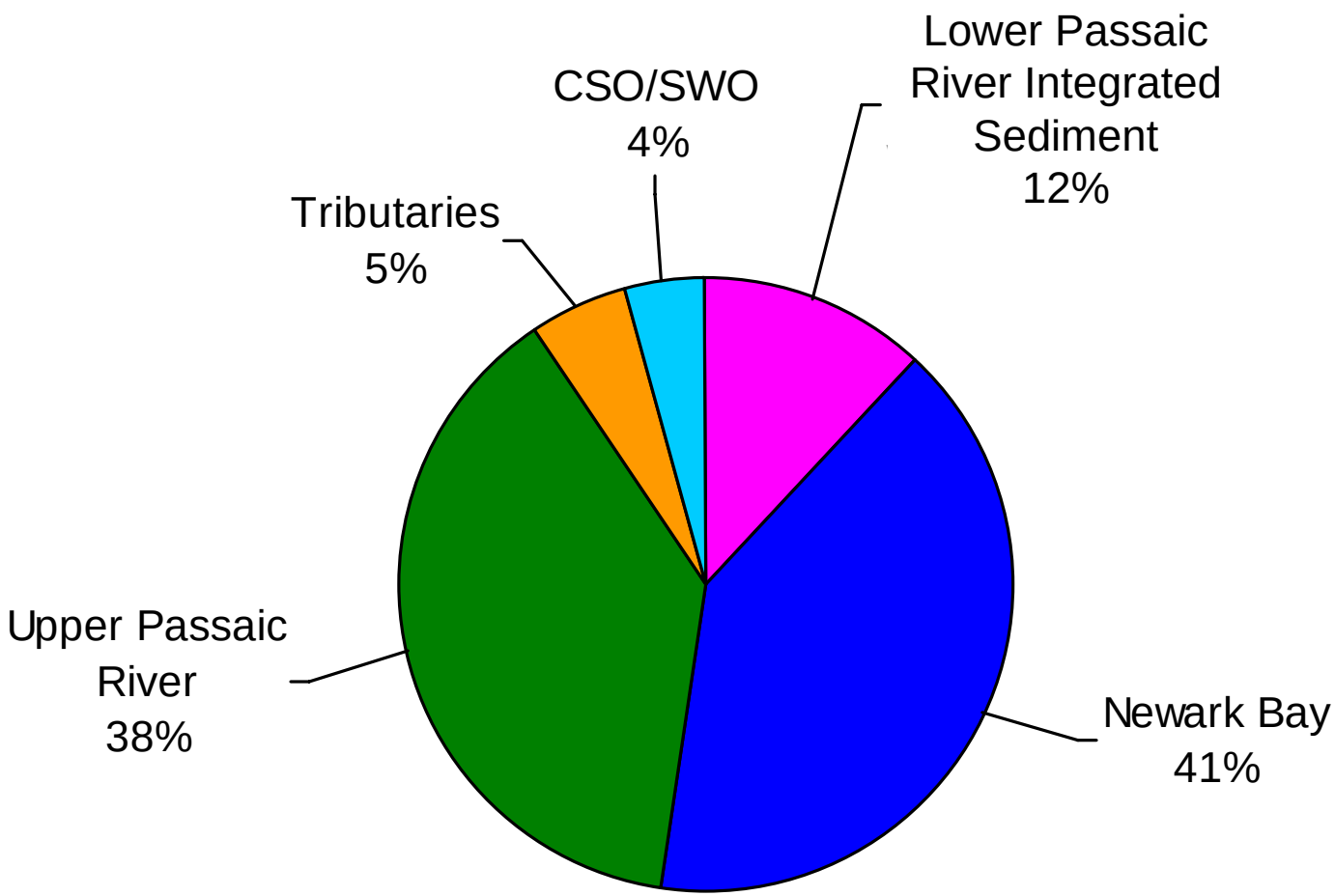

Legend

- Lower Passaic River Integrated Sediment
- Newark Bay
- Upper Passaic River
- Tributaries
- CSO/SWO

Notes

"Upper Passaic River" is the core top from Dundee Lake at RM18.3.

"Tributaries" is a watershed-weighted average of Saddle River, Second River, and Third River.

"Newark Bay" represents the average of the five southern samples only.

"Lower Passaic River Integrated Sediment" is the average of high resolution cores.

Averages were calculated using all available data.

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Solids Contribution for the Length-Weighted Average Scenario

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Figure 2.4-8

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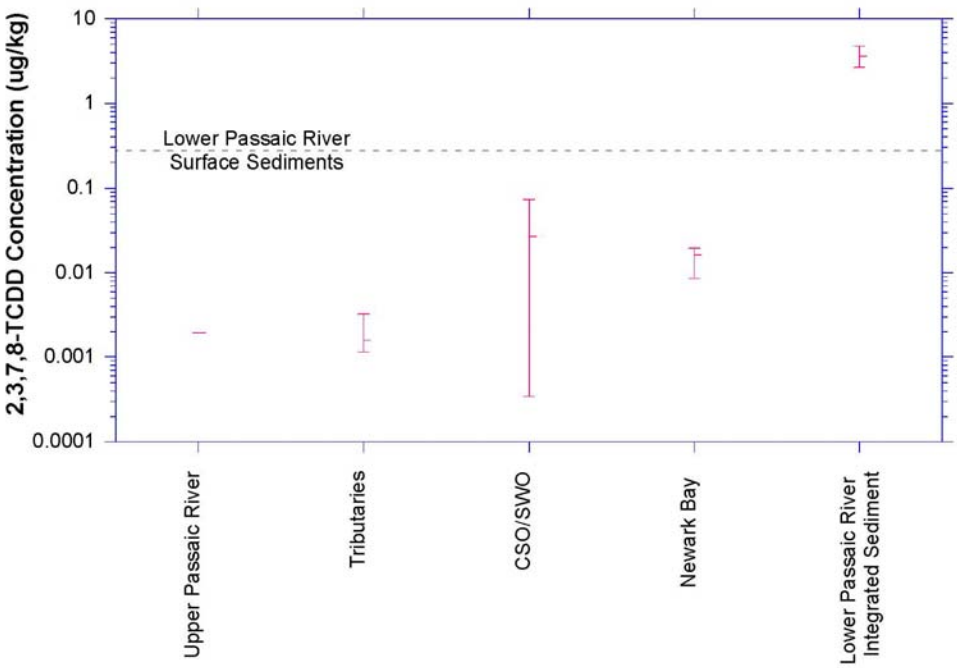
Solids Contribution for 2,3,7,8-TCDD



Legend

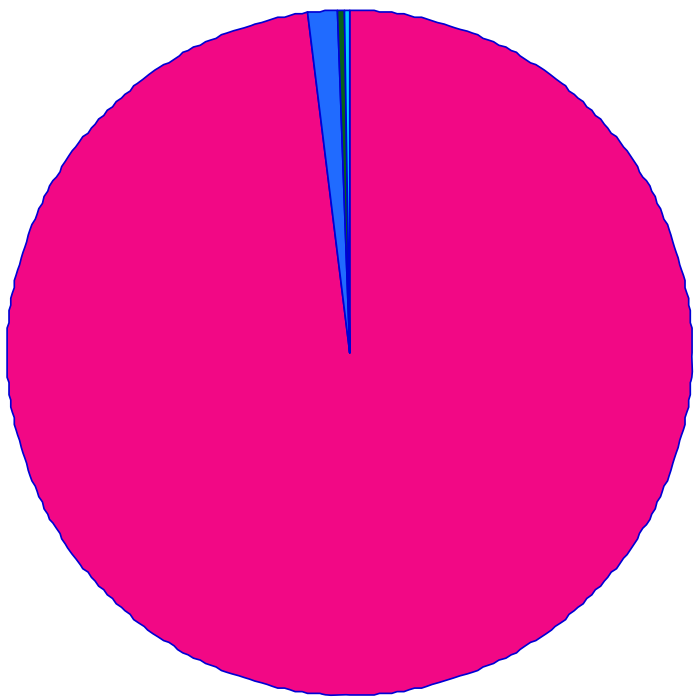
- Maximum
- Mean
- Minimum

Notes

See below.

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

2,3,7,8-TCDD Mass Balance



Legend

- Lower Passaic River Integrated Sediment
- Newark Bay
- Upper Passaic River
- Tributaries
- CSO/SWO

Notes

"Upper Passaic River" is the core top from Dundee Lake at RM18.3.

"Tributaries" is a watershed-weighted average of Saddle River, Second River, and Third River.

"Newark Bay" represents the average of the five southern samples only.

"Lower Passaic River Integrated Sediment" is the average of high resolution cores.

Averages were calculated using all available data.

Solids Contribution and Mass Balance for 2,3,7,8-TCDD

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Figure 2.4-9

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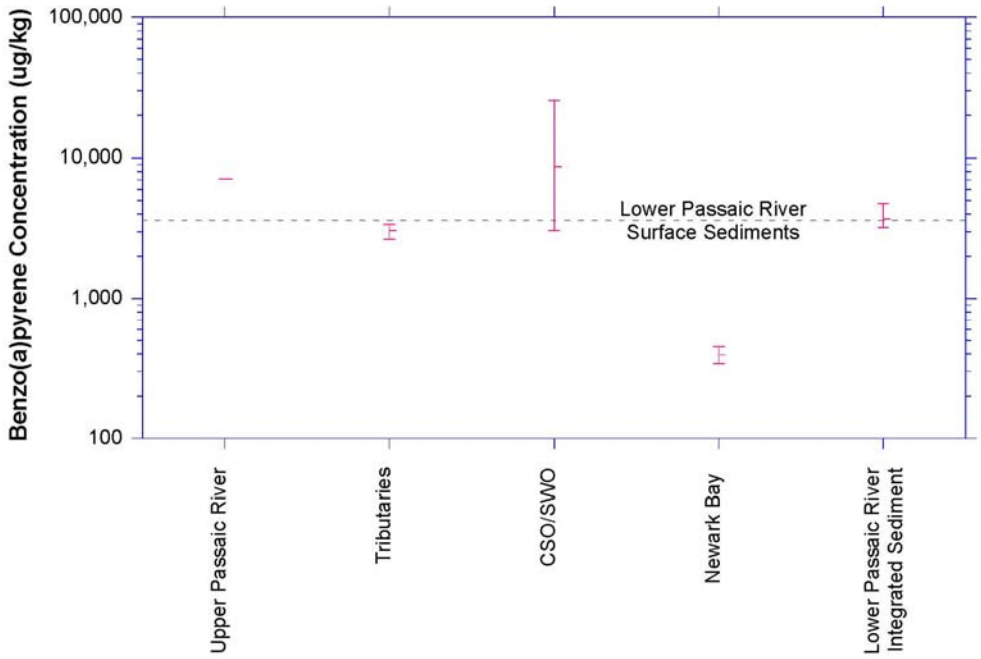
Solids Contribution for Benzo(a)pyrene



Legend

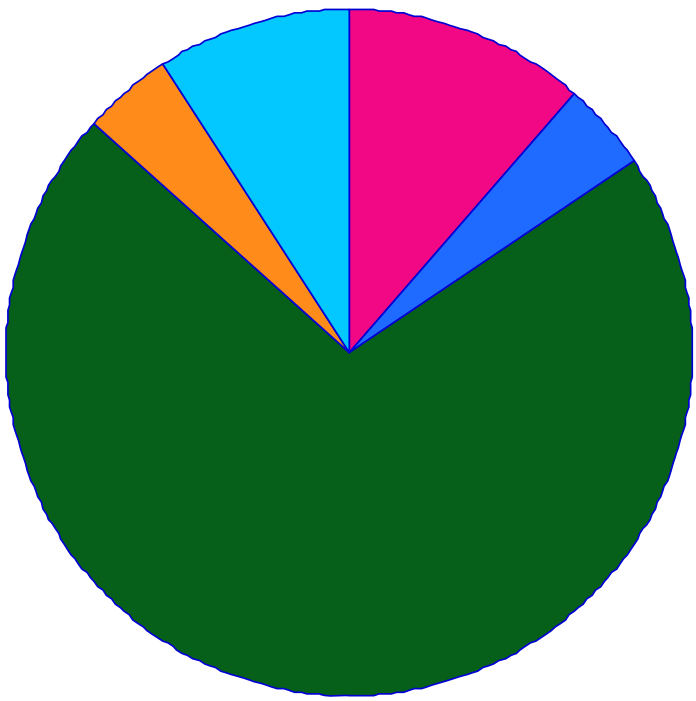
- Maximum
- Mean
- Minimum

Notes

See below.

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

Benzo(a)pyrene Mass Balance



Legend

- Lower Passaic River Integrated Sediment
- Newark Bay
- Upper Passaic River
- Tributaries
- CSO/SWO

Notes

"Upper Passaic River" is the core top from Dundee Lake at RM18.3.

"Tributaries" is a watershed-weighted average of Saddle River, Second River, and Third River.

"Newark Bay" represents the average of the five southern samples only.

"Lower Passaic River Integrated Sediment" is the average of high resolution cores.

Averages were calculated using all available data.

Solids Contribution and Mass Balance for Benzo[a]pyrene

Lower Passaic River Restoration Project

Figure 2.4-10

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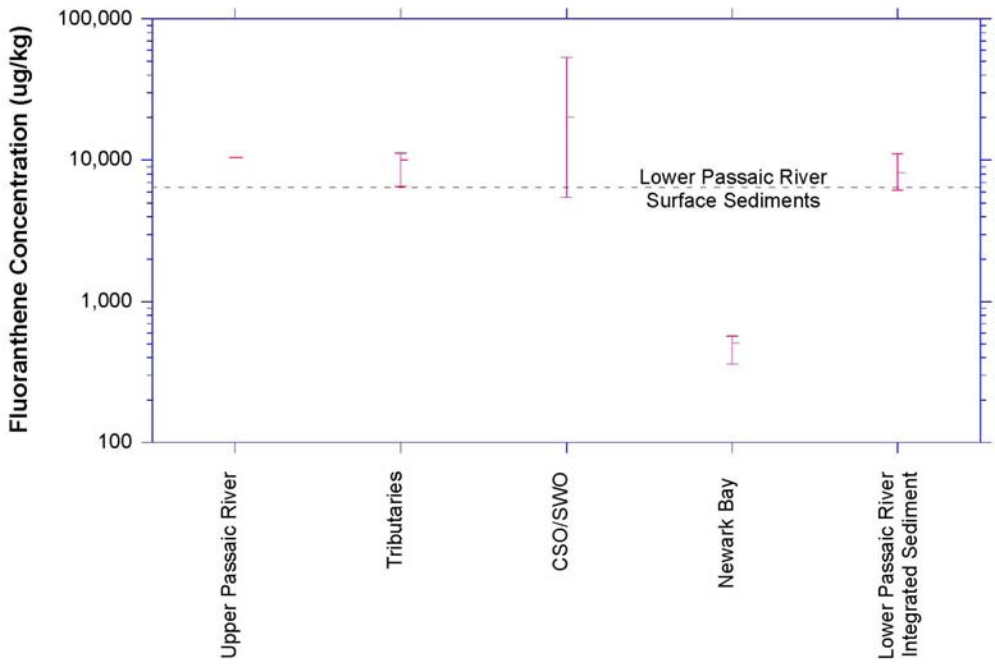
Solids Contribution for Fluoranthene



Legend

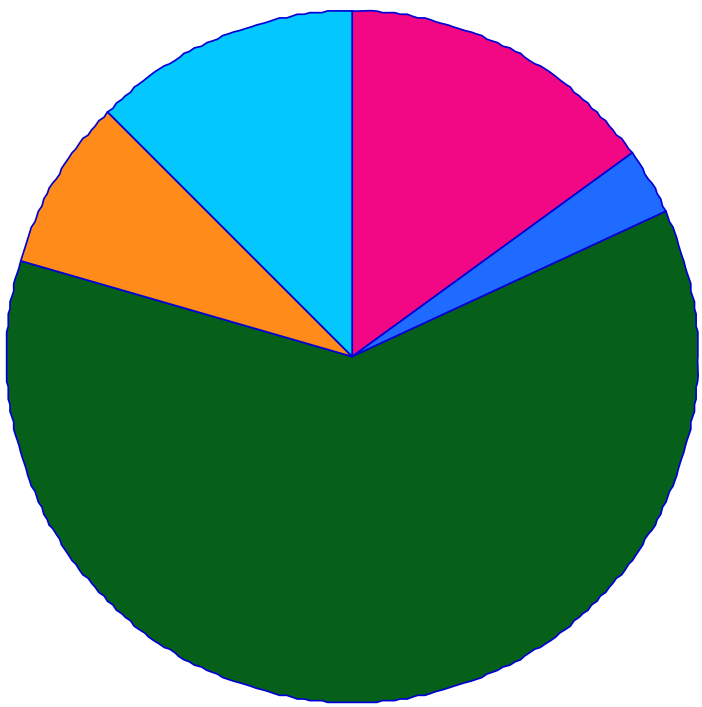
- Maximum
- Mean
- Minimum

Notes

See below.

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

Fluoranthene Mass Balance



Legend

- Lower Passaic River Integrated Sediment
- Newark Bay
- Upper Passaic River
- Tributaries
- CSO/SWO

Notes

"Upper Passaic River" is the core top from Dundee Lake at RM18.3.

"Tributaries" is a watershed-weighted average of Saddle River, Second River, and Third River.

"Newark Bay" represents the average of the five southern samples only.

"Lower Passaic River Integrated Sediment" is the average of high resolution cores.

Averages were calculated using all available data.

Solids Contribution and Mass Balance for Fluoranthene

Lower Passaic River Restoration Project

Figure 2.4-11

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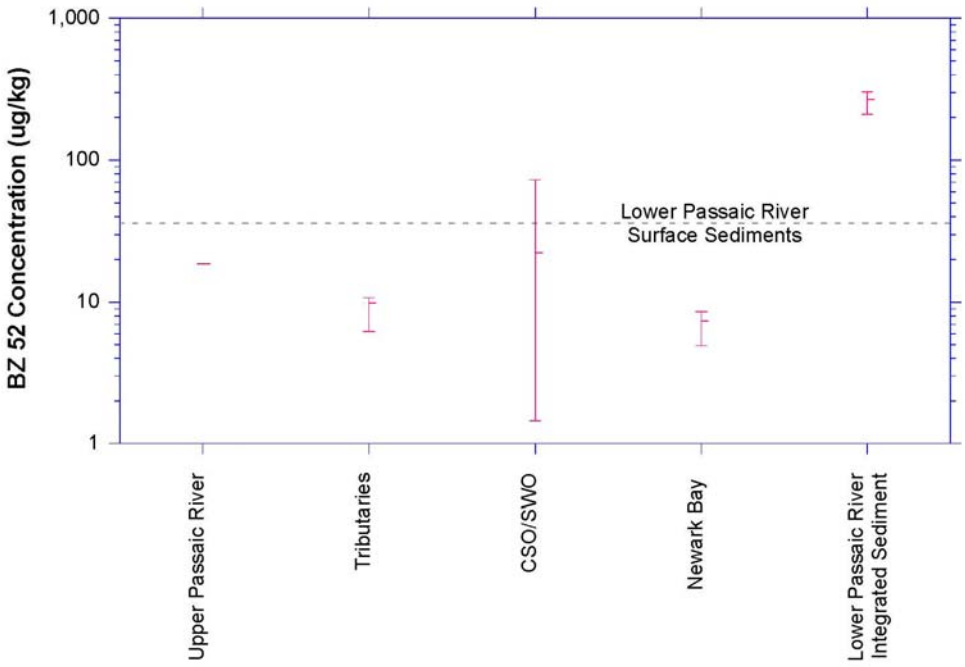
Solids Contribution for BZ 52



Legend

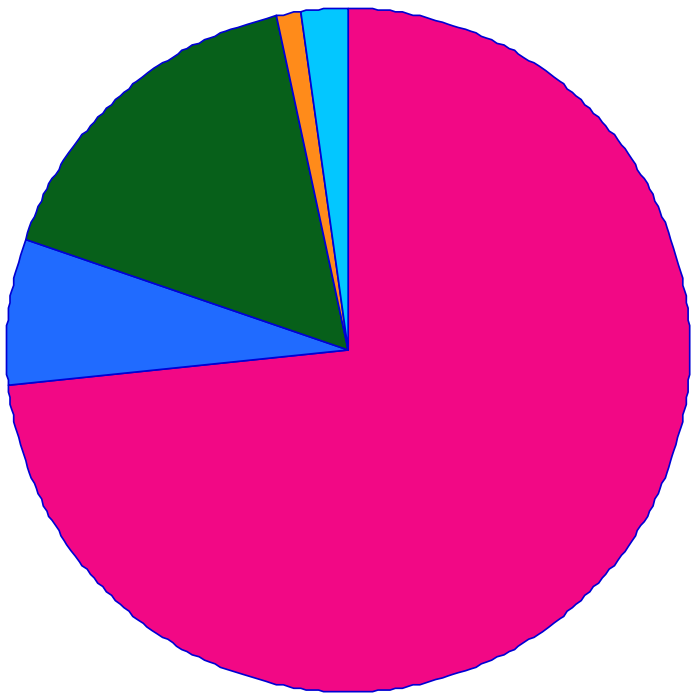
- Maximum
- Mean
- Minimum

Notes

See below.

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

BZ 52 Mass Balance



Legend

- Lower Passaic River Integrated Sediment
- Newark Bay
- Upper Passaic River
- Tributaries
- CSO/SWO

Notes

"Upper Passaic River" is the core top from Dundee Lake at RM18.3.

"Tributaries" is a watershed-weighted average of Saddle River, Second River, and Third River.

"Newark Bay" represents the average of the five southern samples only.

"Lower Passaic River Integrated Sediment" is the average of high resolution cores.

Averages were calculated using all available data.

Solids Contribution and Mass Balance for BZ 52

Lower Passaic River Restoration Project

Figure 2.4-12

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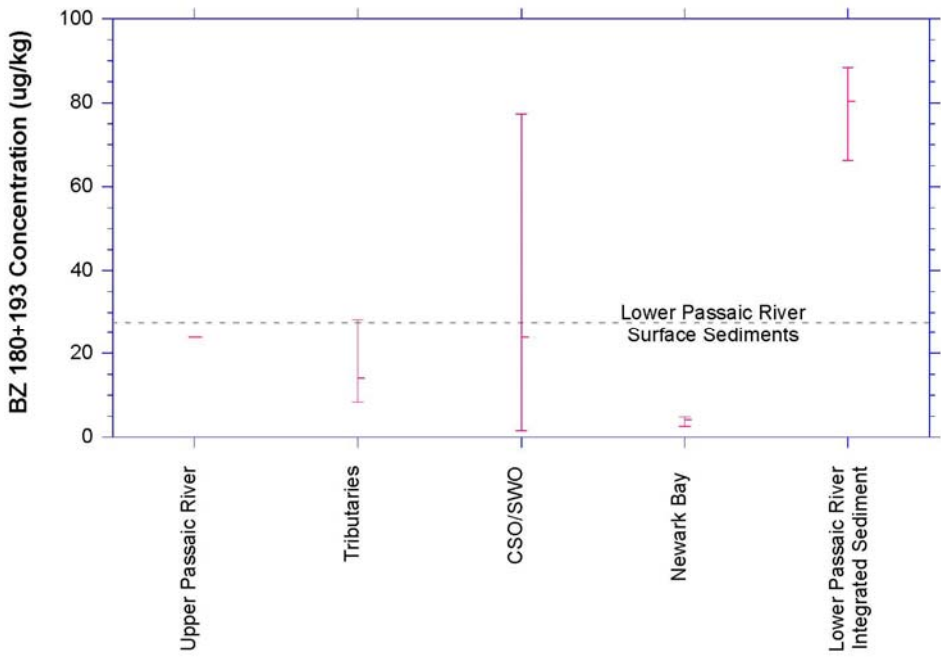
Solids Contribution for BZ 180+193



Legend

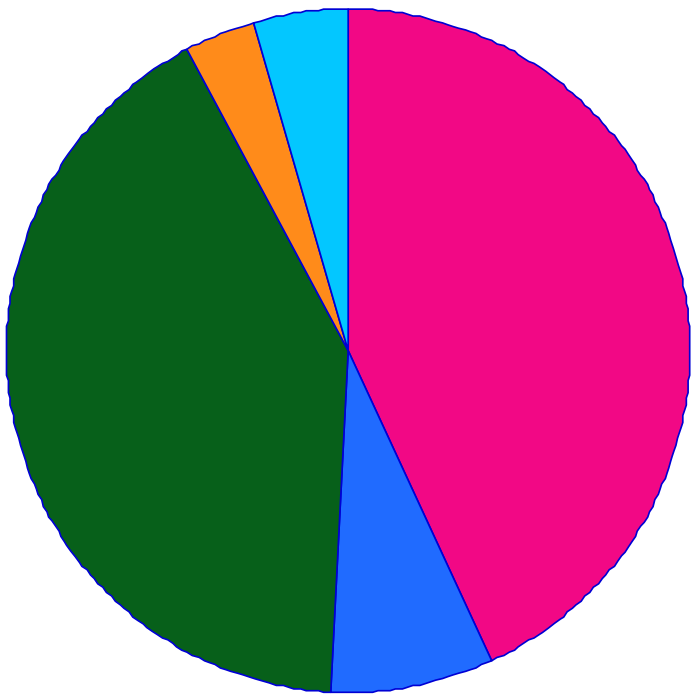
- Maximum
- Mean
- Minimum

Notes

See below.

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

BZ 180+193 Mass Balance



Legend

- Lower Passaic River Integrated Sediment
- Newark Bay
- Upper Passaic River
- Tributaries
- CSO/SWO

Notes

"Upper Passaic River" is the core top from Dundee Lake at RM18.3.

"Tributaries" is a watershed-weighted average of Saddle River, Second River, and Third River.

"Newark Bay" represents the average of the five southern samples only.

"Lower Passaic River Integrated Sediment" is the average of high resolution cores.

Averages were calculated using all available data.

Solids Contribution and Mass Balance for BZ 180+193

Lower Passaic River Restoration Project

Figure 2.4-13

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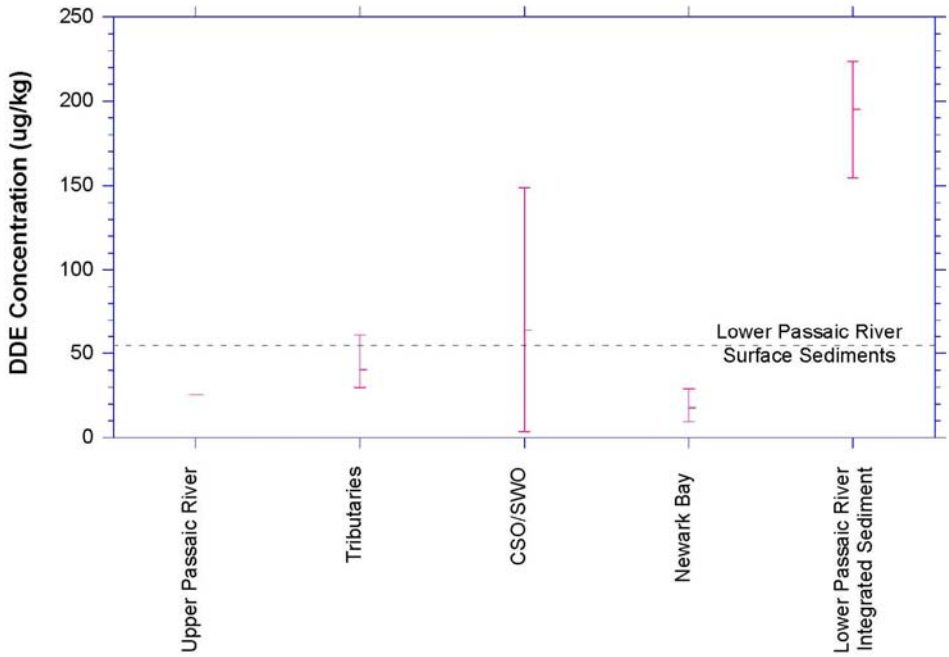
Solids Contribution for DDE



Legend

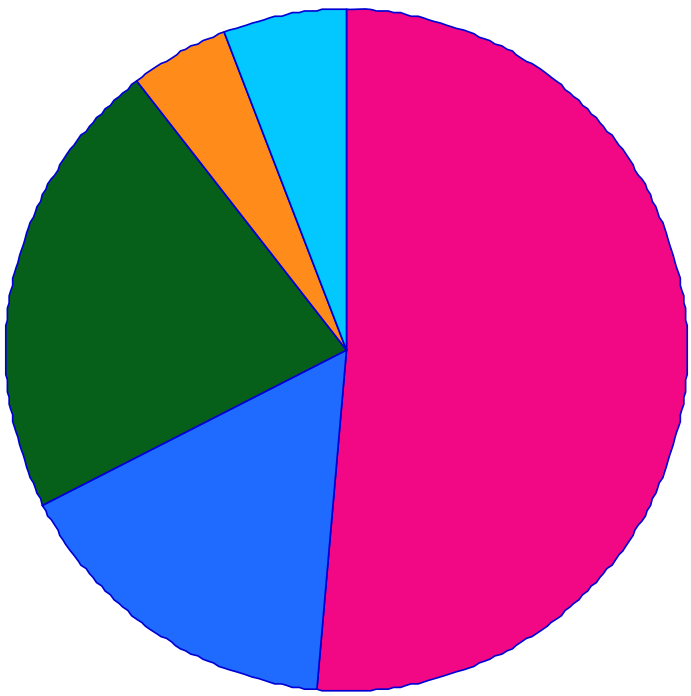
- Maximum
- Mean
- Minimum

Notes

See below.

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

DDE Mass Balance



Legend

- Lower Passaic River Integrated Sediment
- Newark Bay
- Upper Passaic River
- Tributaries
- CSO/SWO

Notes

DDE represents only the 4,4'-isomer.

"Upper Passaic River" is the core top from Dundee Lake at RM18.3.

"Tributaries" is a watershed-weighted average of Saddle River, Second River, and Third River.

"Newark Bay" represents the average of the five southern samples only.

"Lower Passaic River Integrated Sediment" is the average of high resolution cores.

Averages were calculated using all available data.

Solids Contribution and Mass Balance for DDE

Lower Passaic River Restoration Project

Figure 2.4-14

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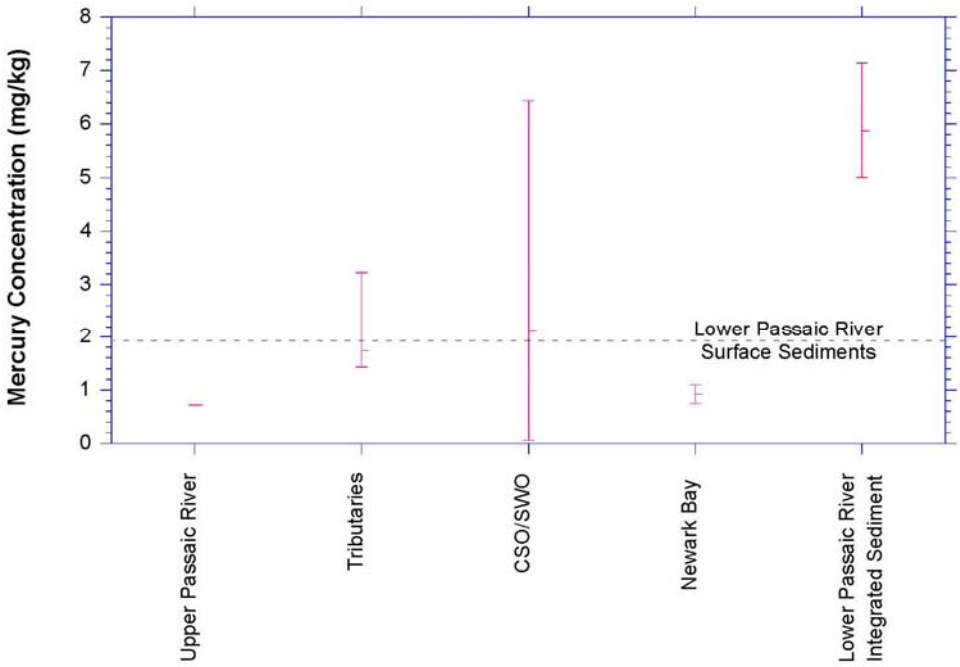
Solids Contribution for Mercury



Legend

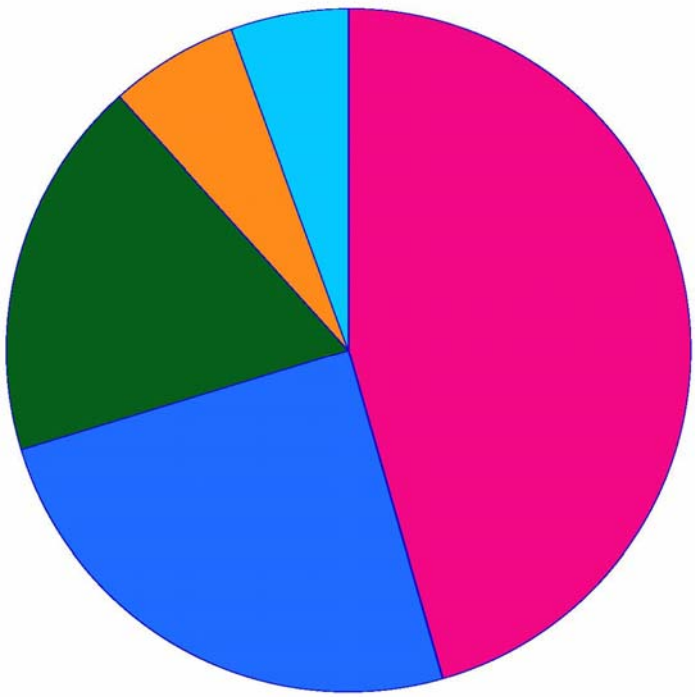
- Maximum
- Mean
- Minimum

Notes

See below.

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

Mercury Mass Balance



Legend

- Lower Passaic River Integrated Sediment
- Newark Bay
- Upper Passaic River
- Tributaries
- CSO/SWO

Notes

"Upper Passaic River" is the core top from Dundee Lake at RM18.3.

"Tributaries" is a watershed-weighted average of Saddle River, Second River, and Third River.

"Newark Bay" represents the average of the five southern samples only.

"Lower Passaic River Integrated Sediment" is the average of high resolution cores.

Averages were calculated using all available data.

Solids Contribution and Mass Balance for Mercury

Lower Passaic River Restoration Project

Figure 2.4-15

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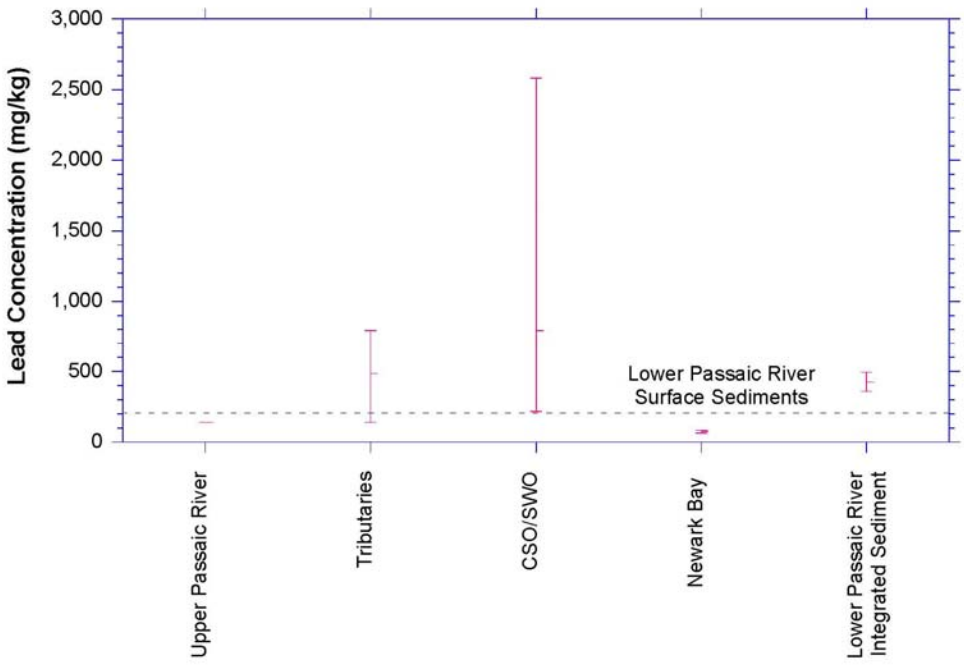
Solids Contribution for Lead



Legend

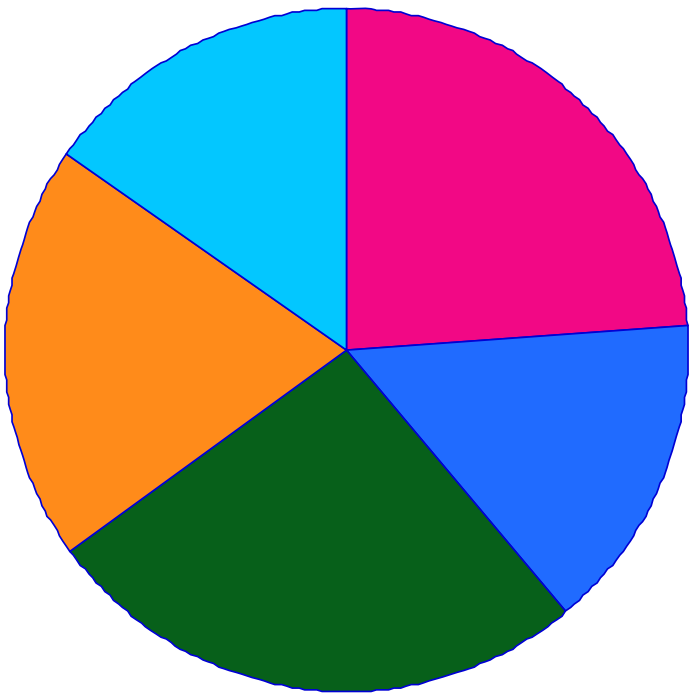
- Maximum
- Mean
- Minimum

Notes

See below.

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

Lead Mass Balance



Legend

- Lower Passaic River Integrated Sediment
- Newark Bay
- Upper Passaic River
- Tributaries
- CSO/SWO

Notes

"Upper Passaic River" is the core top from Dundee Lake at RM18.3.

"Tributaries" is a watershed-weighted average of Saddle River, Second River, and Third River.

"Newark Bay" represents the average of the five southern samples only.

"Lower Passaic River Integrated Sediment" is the average of high resolution cores.

Averages were calculated using all available data.

Solids Contribution and Mass Balance for Lead

Lower Passaic River Restoration Project

Figure 2.4-16

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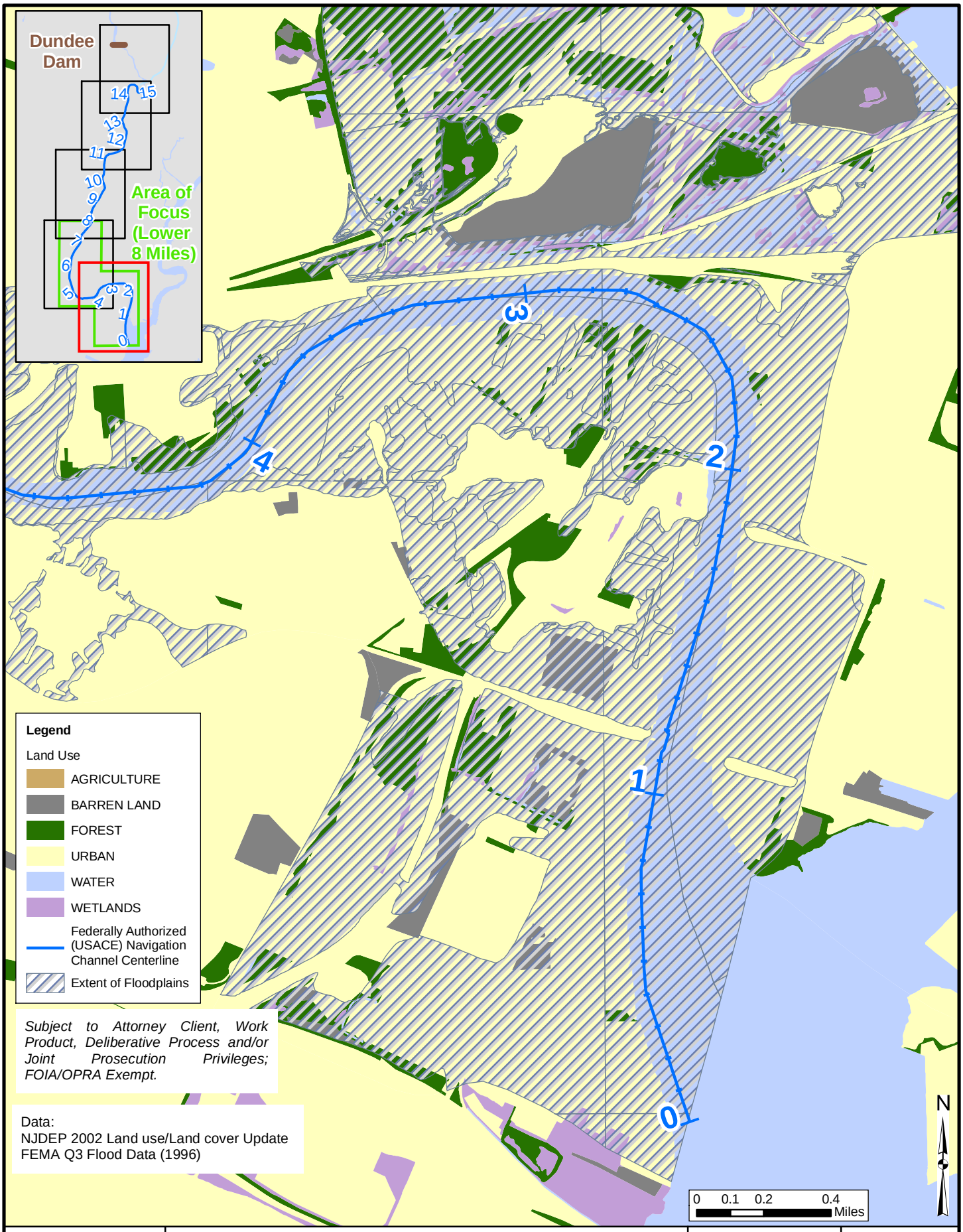

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

Data:
NJDEP 2002 Land use/Land cover Update
FEMA Q3 Flood Data (1996)

Current Land Use (RM0 - RM4)

Lower Passaic River Restoration Project

Figure 2.5-1a

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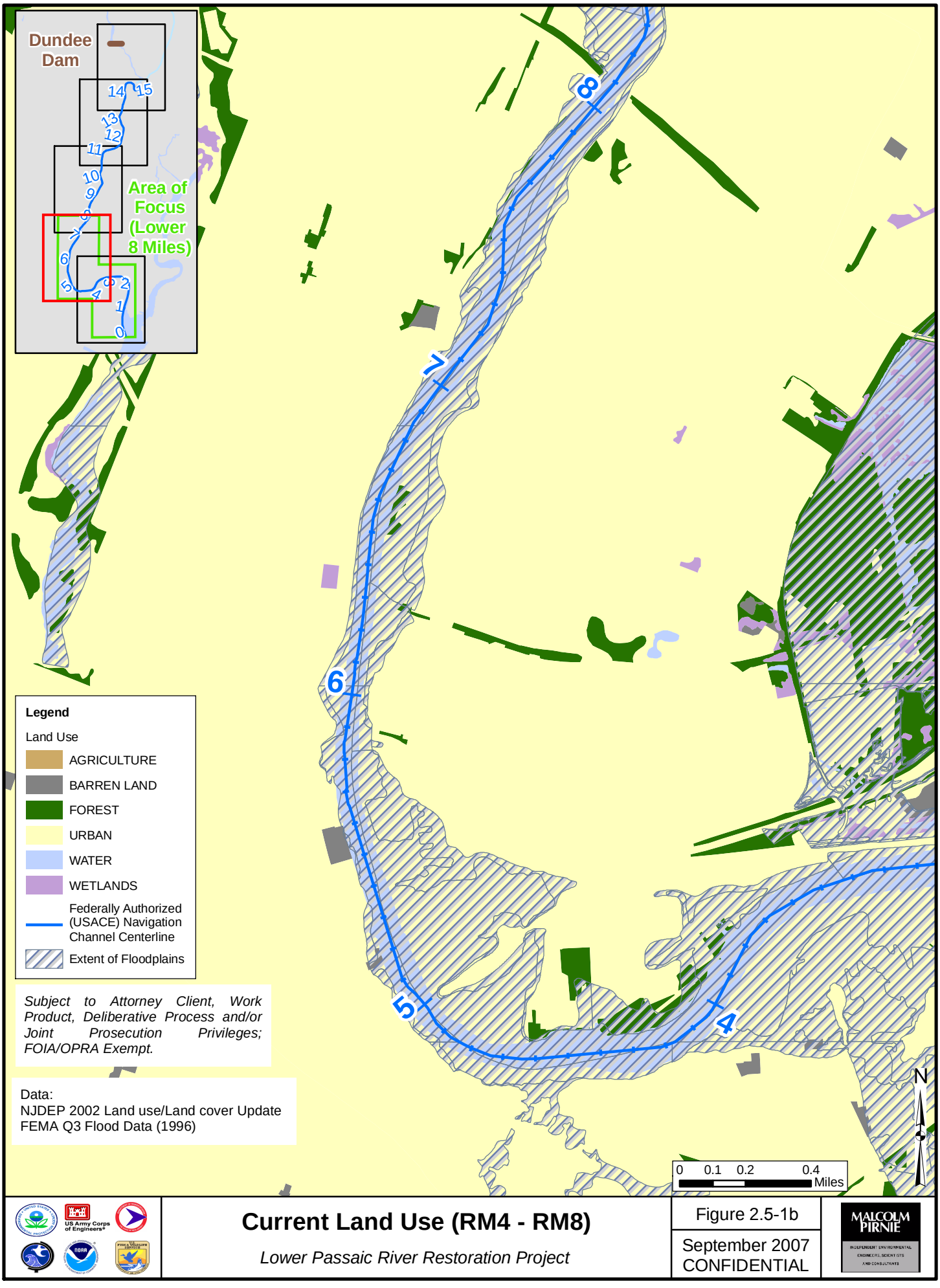

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt.

Data:
NJDEP 2002 Land use/Land cover Update
FEMA Q3 Flood Data (1996)

Current Land Use (RM4 - RM8)

Lower Passaic River Restoration Project

Figure 2.5-1b

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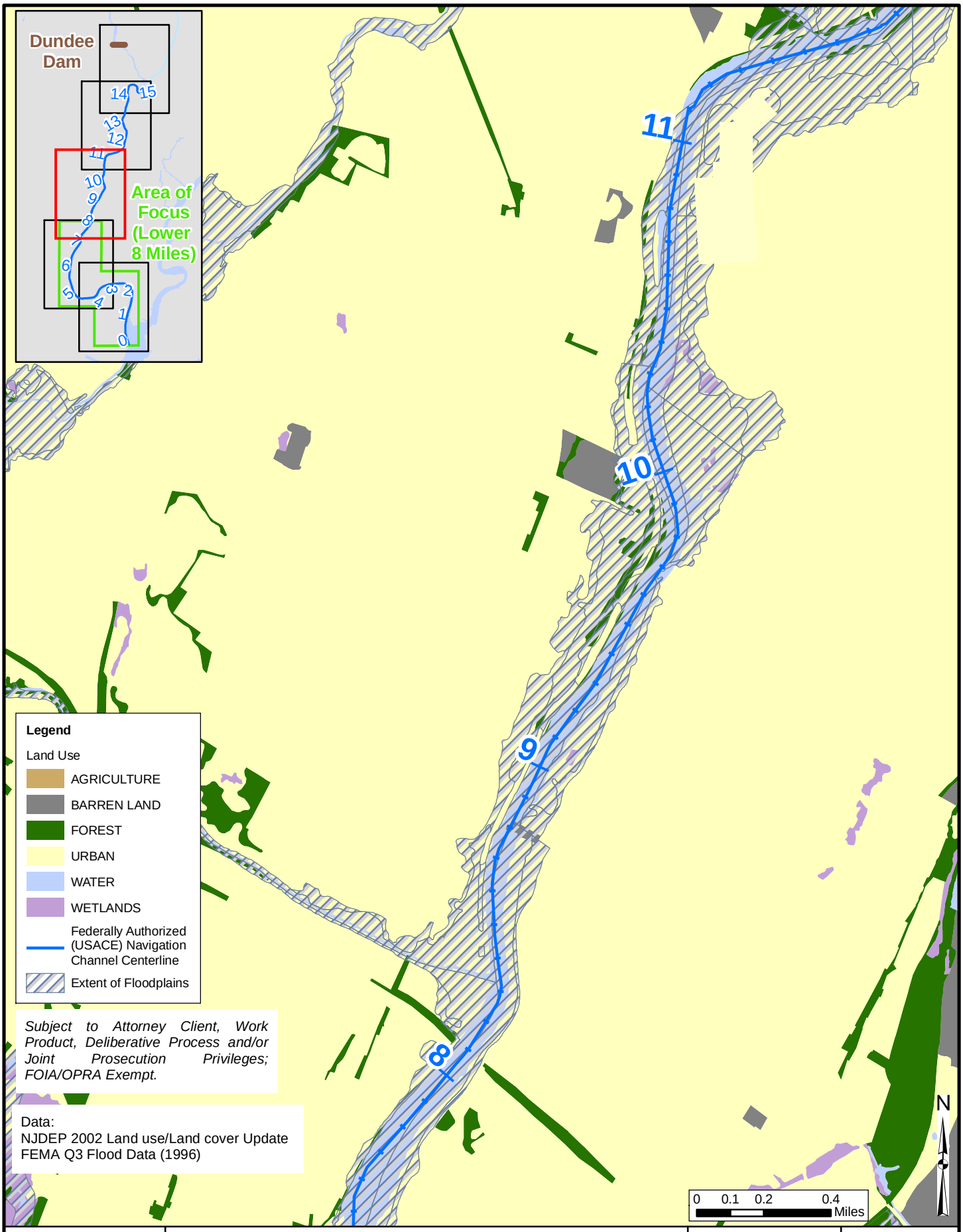

Current Land Use (RM8 - RM11)

Lower Passaic River Restoration Project

Figure 2.5-1c

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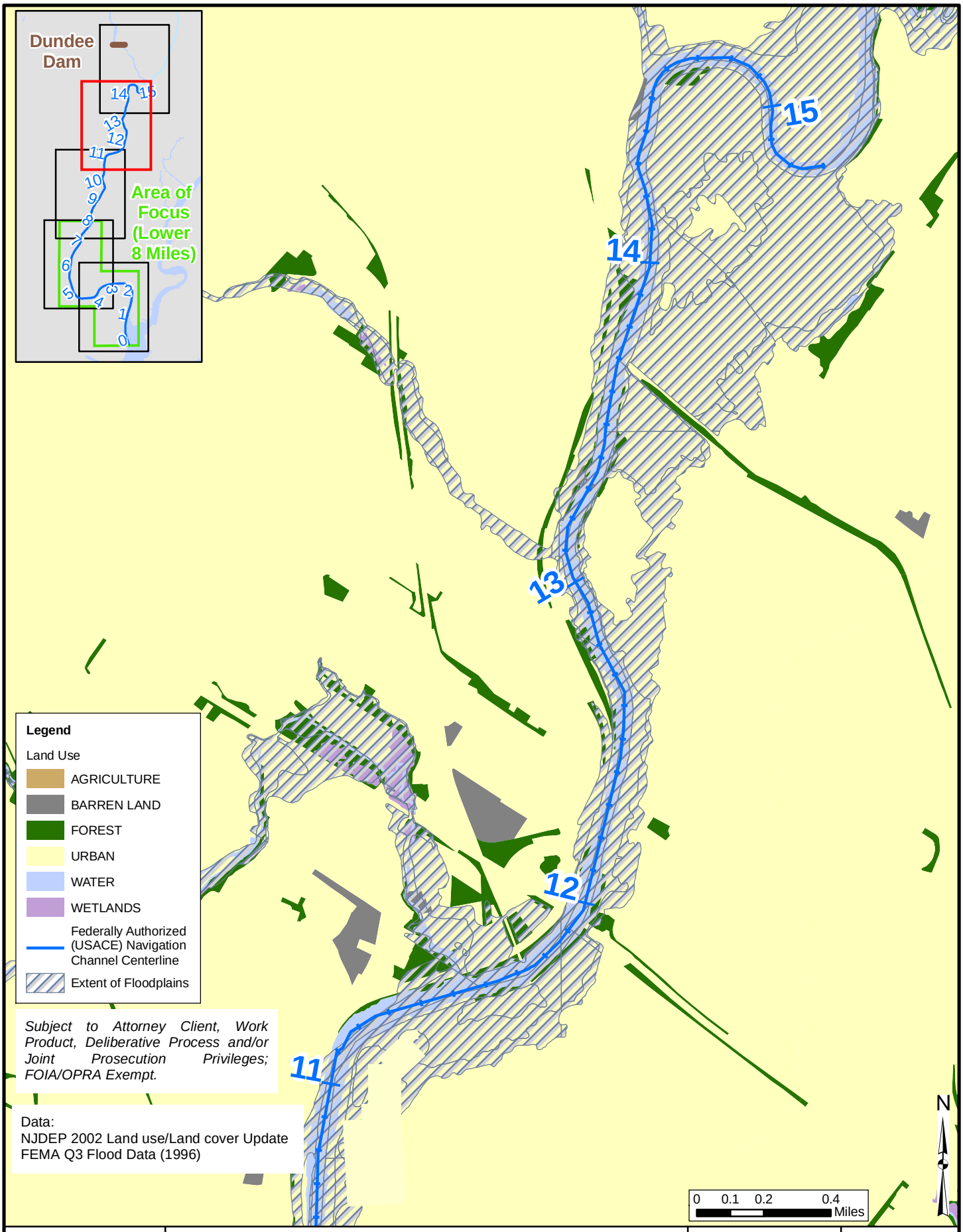

Current Land Use (RM11 - RM15)

Lower Passaic River Restoration Project

Figure 2.5-1d

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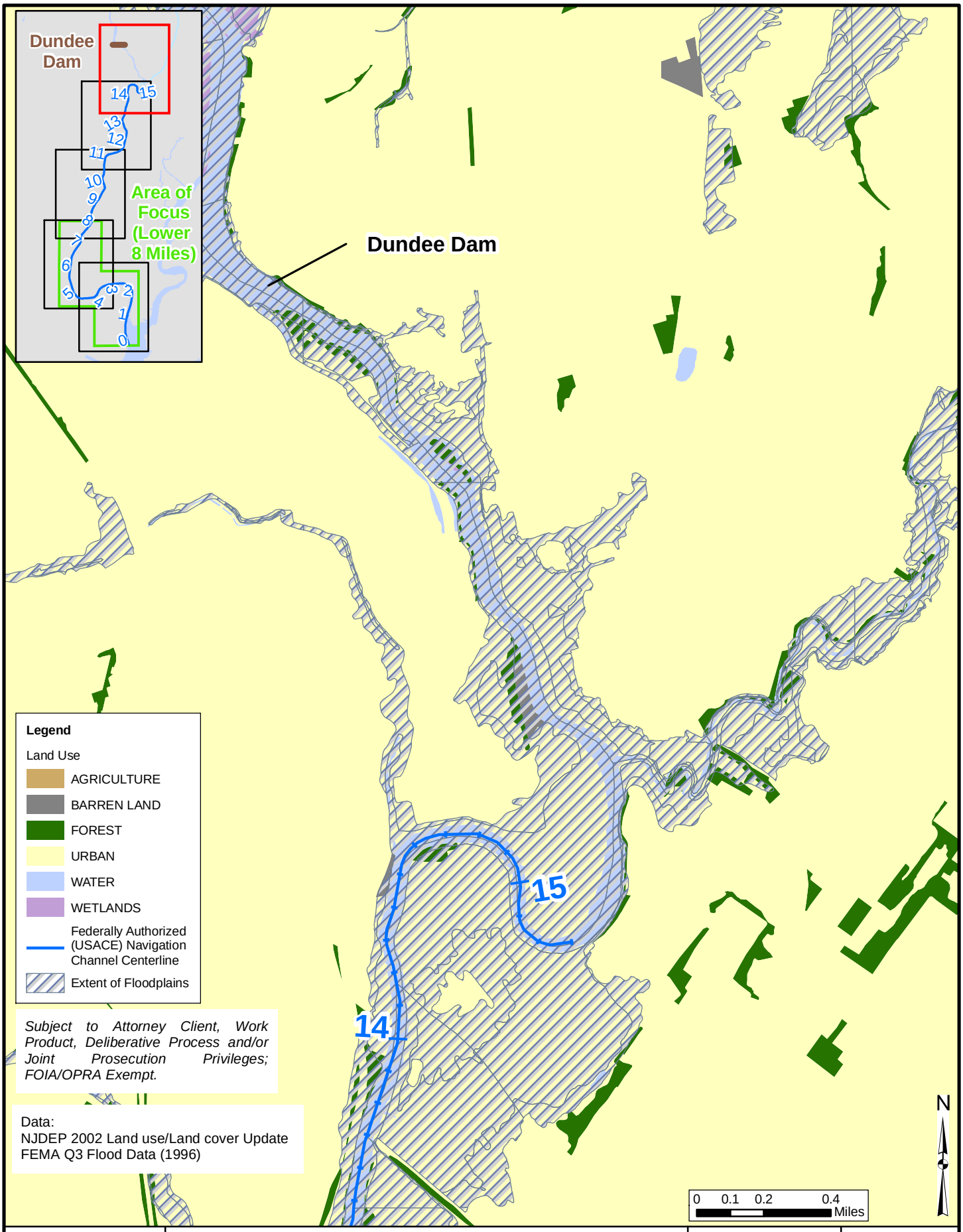

Current Land Use (RM15 - Dundee Dam)

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Figure 2.5-1e

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new jersey department of transportation

Lower Passaic River Restoration Project

Municipality Plans for Future Use of River

Miles 0 to 8

Legend

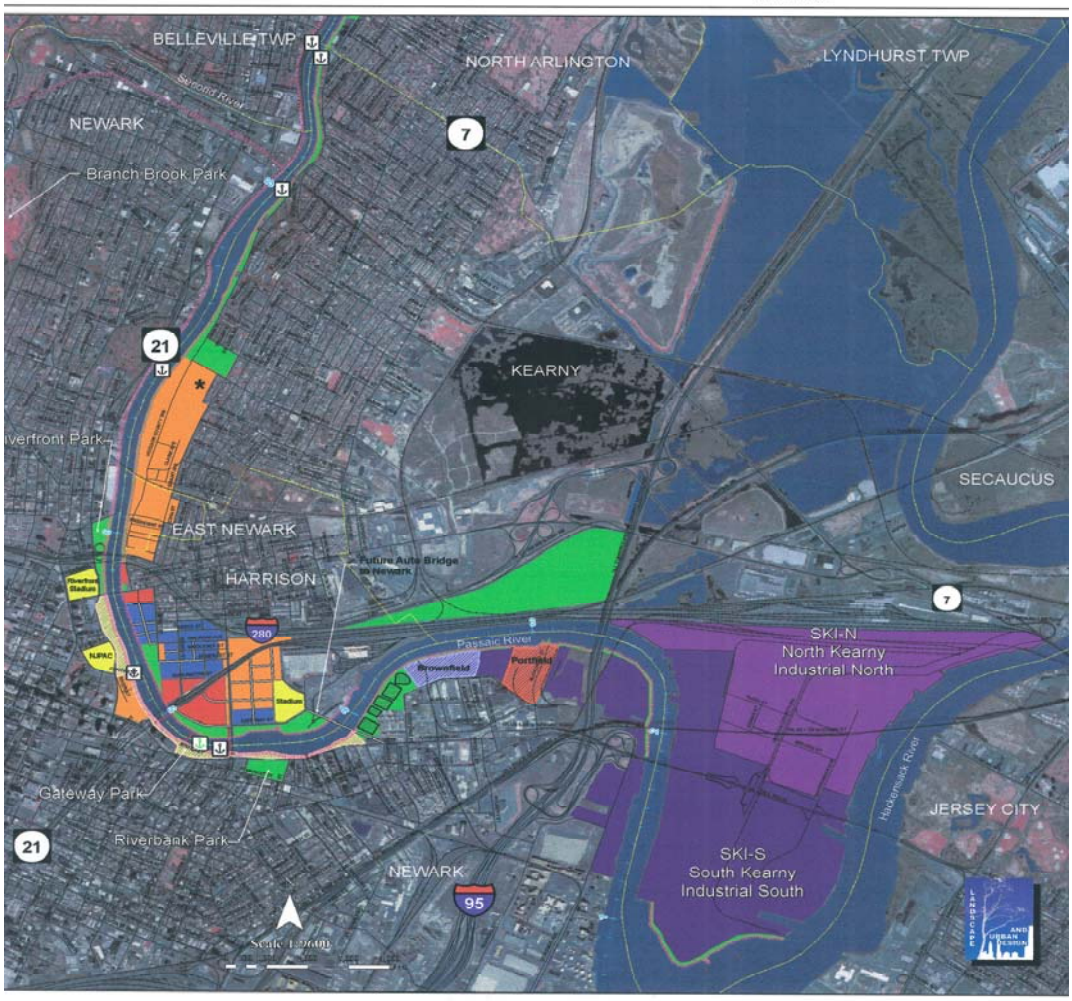
- Lister Avenue Brownfield Development Area
- Blanchard Street/Fairmont Chemical Development Area
- Boating: Recreation/Commercial (marina, dock, ramp)
- Bikepath/Walkway
- Proposed Street
- Pedestrian Bridge
- Athletic Fields
- Entertainment
- Minish Park Boundary
- Open Space/Recreation
- Industrial
- Mixed Use (Residential/Commercial [Retail/Office])
- Residential
- Commercial

Notes:

1. Aerial photograph is 2002 Orthophotography. These files are projected as 1983 New Jersey State Plane Coordinates in feet.

Boating area to include water taxi, tour & educational boats

* Also includes recreation activities & entertainment destination



Source of image: Source Control Early Action Focused Feasibility Study: Lower Passaic River Restoration Project. Prepared by Malcolm Pirnie, Inc., 2007. Appendix F: Navigation Studies. "New Jersey's Position on the Future Navigational Use on the Lower Passaic River, River Miles 0 – 8." Prepared by NJDOT, 2007.

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Municipality Plans for Future Use of River Miles 0 to 8

Lower Passaic River Restoration Project

Figure 2.5-2

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N

Legend

- Dredging followed by Backfill
- Capping
- Capping after Dredging
- Capping with Pre-Dredging
- Armored Capping
- Navigational Channel
- Shoreline as defined by the New Jersey Department of Environmental Protection
- Area of Focus/Proposed Extent of Cap or Backfill
- Bridges and Bridge Abutments
- Tidal Mudflats
- Political Boundary - Municipalities
- Political Boundary - Counties

Kearny

East Newark

Harrison

Newark

Jersey City

8 7 6 5 4 3 2 1 0

0 1,000 2,000 4,000 Feet

Notes on Data Sources
Bridge and Bridge Abutments - NOAA electronic navigation data
Federal Navigation Channel - USACE
Lower Passaic River Centerline - Generated by Malcolm Pirnie, Inc. based on Federal Channel.
Shoreline - NJDEP
Existing Sediment Surface - 2004 USACE Bathymetry
Acronyms
NJDEP - New Jersey Department of Environmental Protection
NOAA - National Oceanic and Atmospheric Administration
MLW - Mean Low Water as defined by USACE
SQ. FT. - Square Feet
USACE - United States Army Corps of Engineers

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Alternative 1:
Removal of Fine-Grained Sediment from Area of Focus

Lower Passaic River Restoration Project

FIGURE 2.8-1

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N

Legend

- Dredging followed by Backfill
- Capping
- Capping after Dredging
- Capping with Pre-Dredging
- Armored Capping
- Navigational Channel
- Shoreline as defined by the New Jersey Department of Environmental Protection
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Kearny

East Newark

Harrison

Newark

Jersey City

8 7 6 5 4 3 2 1 0

0 1,000 2,000 4,000 Feet

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Alternative 2: Engineered Capping of Area of Focus

Lower Passaic River Restoration Project

FIGURE 2.8-2

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N

Depth of Navigational Channel: 10 feet

Depth of Navigational Channel: 16 feet

Depth of Navigational Channel: 20 feet

Depth of Navigational Channel: 20 feet

Depth of Navigational Channel: 30 feet

Depth of Navigational Channel: 30 feet

8

7

6

5

4

3

2

1

0

Kearny

East Newark

Harrison

Newark

Jersey City

Legend

- Dredging followed by Backfill
- Capping
- Capping after Dredging
- Capping with Pre-Dredging
- Armored Capping
- Navigational Channel
- Shoreline as defined by the New Jersey Department of Environmental Protection
- Area of Focus/Proposed Extent of Cap or Backfill
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0 1,000 2,000 4,000 Feet

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Alternative 3:
Engineered Capping of Area of Focus Following Reconstruction of Federally Authorized Navigation Channel

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FIGURE 2.8-3

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N

Depth of Navigational Channel: Existing Depth

Depth of Navigational Channel: Existing Depth

Depth of Navigational Channel: Existing Depth

Depth of Navigational Channel: Existing Depth

Depth of Navigational Channel: 16 feet

Depth of Navigational Channel: 30 feet

8
7
6
5
4
3
2
1
0

East Newark

Harrison

Kearny

Newark

Jersey City

Legend

- Dredging followed by Backfill
- Capping
- Capping after Dredging
- Capping with Pre-Dredging
- Armored Capping
- Navigational Channel
- Shoreline as defined by the New Jersey Department of Environmental Protection
- Area of Focus/Proposed Extent of Cap or Backfill
- Bridges and Bridge Abutments
- Tidal Mudflats
- Political Boundary - Municipalities
- Political Boundary - Counties

0 1,000 2,000 4,000 Feet

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Alternative 4: Engineered Capping of Area of Focus Following Construction of Navigation Channel to Accommodate Current Usage

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FIGURE 2.8-4

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N

Depth of Navigational Channel: 10 feet

Depth of Navigational Channel: 10 feet

Depth of Navigational Channel: 16 feet

Depth of Navigational Channel: 10 feet

Depth of Navigational Channel: 16 feet

Depth of Navigational Channel: 30 feet

8

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4

3

2

1

0

East Newark

Harrison

Kearny

Newark

Jersey City

Legend

- Dredging followed by Backfill
- Capping
- Capping after Dredging
- Capping with Pre-Dredging
- Armored Capping
- Navigational Channel
- Shoreline as defined by the New Jersey Department of Environmental Protection
- Area of Focus/Proposed Extent of Cap or Backfill
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- Tidal Mudflats
- Political Boundary - Municipalities
- Political Boundary - Counties

0 1,000 2,000 4,000 Feet

Notes on Data Sources
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Federal Navigation Channel - USACE
Lower Passaic River Centerline - Generated by Malcolm Pirnie, Inc. based on Federal Channel.
Shoreline - NJDEP
Existing Sediment Surface - 2004 USACE Bathymetry

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MLW - Mean Low Water as defined by USACE
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USACE - United States Army Corps of Engineers

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Alternative 5:
Engineered Capping of Area of Focus Following Construction of Navigation Channel to Accommodate Future Usage

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FIGURE 2.8-5

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N

Depth of Navigational Channel: 10 feet

Depth of Navigational Channel: 10 feet

Depth of Navigational Channel: 16 feet

Depth of Navigational Channel: 10 feet

Depth of Navigational Channel: 16 feet

Depth of Navigational Channel: 30 feet

8

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2

1

0

East Newark

Harrison

Kearny

Newark

Jersey City

Legend

- Dredging followed by Backfill
- Capping
- Capping after Dredging
- Capping with Pre-Dredging
- Armored Capping
- Navigational Channel
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0 1,000 2,000 4,000 Feet

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Alternative 6:
Engineered Capping of Area of Focus Following Construction of Navigation Channel to Accommodate Future Usage and Removal of Fine-Grained Sediment from Primary Erosional Zone and Primary Inventory Zone

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FIGURE 2.8-6

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